

What is claimed is:

1. A position information transmission method for transmitting and receiving road shape information, the method comprising the steps of:

intermittently selecting nodes in a target road section on a digital map;

transmitting road shape information, wherein the road shape information includes coordinate data of a selected nodes and designates a target road section;

executing a map matching based on the road shape information including coordinate information of the selected nodes;

obtaining a road between the selected nodes by using a route search; and

identifying the target road section on the digital map;

wherein said steps of selecting nodes and transmitting road shape information are executed at a transmitting side, and

wherein said steps of executing a map matching, obtaining a road, and identifying the target road section are executed at a receiving side.

2. The method according to claim 1,

wherein the road shape information transmitted from the transmitting side includes supplementary information indicating attributes of the selected nodes, and

wherein the receiving side references the supplementary information in the step of executing a map matching in order to determine the positions of the nodes.

3. The method according to claim 2,

wherein the supplementary information indicating the attributes of the nodes includes at least one of a node type, a node name, a number of connecting links, angles between connecting links, and an intercept azimuth at the selected node.

4. The method according to claim 2,

wherein the supplementary information indicating the attributes of the node includes a n intercept azimuth at the selected node and at least one of a node type, a node name, a number of connecting links, and angles between connecting links.

5. The method according to claim 1,

wherein the road shape information transmitted from the transmitting side includes supplementary information indicating attributes of links included between the selected nodes, and

wherein the receiving device references the supplementary information during using the route search in the step of obtaining the road between the nodes.

6. The method according to claim 5,

wherein the supplementary information indicating the attributes of the links includes at least one of a road type, a road number, and a link type.

7. The method according to claim 1,

wherein the transmitting side selects a plurality of nodes arranged around the selected node in the step of intermittently selecting nodes in the target road section and transmits the road shape information including the coordinate

data of each selected node.

8. The method according to claim 1, further comprising the steps of:

evaluating an accuracy of the matching at the receiving side based on a distance from the node to a closest point on an adjacent road and a difference between intercept azimuths at the node and at the closest point on the adjacent road;

selecting a plurality of nodes arranged around the selected node in the step of the intermittently selecting nodes in the target road section; and

transmitting the road shape information including the coordinate data of each selected node;

wherein the steps of evaluating an accuracy of the matching, selecting a plurality of nodes, and transmitting the road shape information are executed at the transmitting side.

9. The method according to claim 1, further comprising the steps of:

comparing a setting date of the digital map data of the road in the target road section with a regulated date; and

transmitting the road shape information including data representing the road shape in the target road section, in case of that the setting date is later than the regulated date;

wherein the steps of the comparing a setting date with a regulated date and transmitting the road shape information are executed at the transmitting side.

10. The method according to claim 1,
wherein the road shape information transmitted from the

transmitting side includes a setting date that the digital map data of the road in the target road section was set, and

wherein the step of identifying the target road section is skipped in case of that the setting date is latter than a creation date of a digital map data which the receiving side owns.

11. The method according to claim 1,

wherein the road shape information transmitted from the transmitting side includes distance data between the intermittently selected nodes, and

the method further comprising the step of:

comparing the distance of the road connecting the nodes obtained by way of the route search and the distance between the nodes in the road shape information; and

discriminating propriety of the route search;

wherein the steps of the comparing the distances and discriminating the propriety are executed at the receiving side.

12. The method according to claim 1, further comprising the steps of:

evaluating an accuracy of the matching of nodes in the target road section; and

determining a length of the target road section or number of the nodes in the road shape information based on the result of the step of evaluating;

wherein the steps of the evaluating the accuracy and determining the length are executed at the transmitting side.

13. The method according to claim 12,

wherein, in the step of evaluating the accuracy, the

accuracy of the matching is evaluated based on a distance from a node to a closest point on an adjacent road and the difference between intercept azimuths at the node and at the closest point.

14. A position information transmission apparatus for transmitting road shape information to specify a target road section on a digital map, the apparatus comprising:

position information converting means for selecting the target road section;

transmit node extracting means for intermittently selecting nodes in the road shape information out of the nodes arranged on the target road section; and

transmitting means for transmitting the selected nodes of the target road section.

15. A position information receiving apparatus for receiving road shape information designating a target road section on a digital map and for specifying the target road section based on the road shape information, the apparatus comprising:

map matching means for performing map matching to determine positions of selected nodes included in the road shape information; and

route search means for obtaining the road connecting the nodes determined to reproduce the target road section.

16. The position information receiving apparatus according to claim 15,

wherein the map matching means executes a map matching based on node information of some of the nodes included in the road shape information to determine the positions of the nodes on a digital map.

17. The position information receiving apparatus according to claim 15,

wherein the map matching means executes a map matching based on node information at least two nodes in the road shape information to determine the positions of the nodes on a digital map.